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however, too early for any serious study of the position of at least several of these elements, inasmuch as the question of even their existence is not settled. However, in a recent paper before the Royal Society, Sir William Crookes shows that helium, argon and krypton fall naturally into the periodic scheme of the elements as devised by him, which differs not very materially from that of Mendeléef. In a postscript to his paper printed in the *Chemical News*, Crookes shows that neon and metargon as far as described also fall naturally into his scheme.

THE boiling point of ozone was determined approximately by Olszewski a few years ago as about -106° . More recently Professor L. Troost has made several very accurate determinations, which are described in the *Comptes Rendus*. The temperature at which the liquefied ozone boiled was determined by an iron-constantin couple, and was -119° . This may then be considered the boiling point of ozone at atmospheric pressure.

It has long been hoped that a study of graphitic acid would lead to better knowledge of the structure of the carbon molecule in graphite. The greatest obstacle has been the difficulty of oxidizing the graphite to graphitic acid. Repeated treatments of graphite with nitric acid and potassium chlorate finally yield but a very small amount of the acid, even if explosions, which are very apt to occur, are successfully avoided. In the last number of the *Berichte* L. Staudenmaier describes a method which consists chiefly in treating graphite that has been partially oxidized by the old method, with a mixture of potassium permanganate and sulfuric acid. In this way the graphitic acid may be rapidly obtained in considerable quantities, and it is to be hoped that its study will now be prosecuted until light is thrown on the graphite molecule and possibly on allotropy in general.

THE question of whether the formula of potassium permanganate should be written KMnO_4 or $\text{K}_2\text{Mn}_2\text{O}_8$ has been in the opinion of many chemists unsettled, even though it was recognized that the salt was isomorphous with the perchlorate, KClO_4 . Even now, in his periodic scheme, Crookes puts both fluorin and manganese into the same group with iron and the platinum metals. The last *Journal* of the Chemical Society (London) contains a research by J. Murray Crofts, of Emmanuel College, on the molecular weights of permanganates, perchlorates and periodates in solution. The salts used were those of potassium and sodium except in the case of the periodate, where the potassium alone was used. The freezing-point method was used, the solvent being Glauber's salt. In every case the molecular weight was that of the simpler formula, so that, as far as solution goes, the formulæ must be considered to be KClO_4 , KIO_4 and KMnO_4 .

J. L. H.

SCIENTIFIC NOTES AND NEWS.

BIOLOGICAL STATION OF THE UNIVERSITY OF INDIANA.

MR. A. C. YODER, of Vincennes, Ind., writes that the Indiana University Biological Station, situated at Vawter Park, Ind., closed its work of the summer on August 19th. The Station was organized in 1895 by Dr. Carl Eigenman, of Indiana University. There is a direct connection between the work done at the Station and at the University proper, credit being given at the one for work done at the other. The Station since organized has been located on Turkey Lake, in northern Indiana. Turkey Lake, about seven miles long and two miles wide, is the largest of the numerous fresh-water lakes found in northern Indiana and is two miles north of the divide, separating the St. Lawrence and Mississippi basins. An abundance of biological material can be had from the lakes on both sides of the divide, and thus are offered excellent opportunities for studying the varia-

tion of species and the influence of different environment. The session of 1898 consisted of two terms of five weeks each. Courses were offered in elementary geology, embryology, bacteriology and botany. Thirteen instructors and assistants were engaged.

The appended data show the success and growth of the Station :

In 1895 there were enrolled 19 students and 1 State represented.

In 1896 there were enrolled 32 students and 4 States represented.

In 1897 there were enrolled 68 students and 5 States represented.

In 1898 there were enrolled 105 students and 8 States represented.

Next year the Station will be in Winona Park, at Warsaw, Ind., eighteen miles from the present location. The Winona Park Association will erect the necessary buildings.

CHRISTMAS ISLAND.

IN a recent issue of *SCIENCE* we reported the return of Mr. C. W. Andrews, of the geological department of the Natural History Museum, from his expedition to Christmas Island. The expedition started about fifteen months ago, and was sent out by Sir John Murray at his own expense. The flora and fauna of the island are believed to have been uninfluenced by man, and therefore the study of these, as well as of the geology of the island, was expected to yield valuable results. We learn from the *London Times* that the results of the expedition are likely to fulfil the highest expectations. Mr. Andrews pursued his labors under the greatest difficulty. The island is 1,200 feet high, but so densely covered with gigantic forest vegetation and bush that the members of the little colony on the shore have never been able to move a mile from home. The only available drinking water is supplied by a spring on the shore, and as the cliffs are lofty and precipitous it is difficult in the extreme to convey the water into the interior. This will give some idea of the difficulties which Mr. Andrews had to face in making his way over the island. As a matter of fact, with the help which he found available, his rate of progress was not more than two miles a day. The island, moreover, swarms with gi-

gantic land-crabs and rats, which, however interesting from a scientific point of view, are plagues to the explorer. Mr. Andrews had often to sleep out unprotected by a tent, and had to adapt himself as best he could to having his toes nipped by the formidable pincers of the crabs, and his body scamped over by hundreds of rats. The only chance of survival for animals in Christmas Island is their ability to climb trees and swing lianas, and both rats and crabs are as accomplished at this as monkeys in an African forest. Mr. Andrews has brought home ample collections of these and of the other animal life which abounds on the island, the insects being particularly rich. The flora of the island, also, is abundantly represented in Mr. Andrews's collections, as well as geology and other branches of science. To geologists especially the island is of great interest. The core of the island is volcanic, but originally a coral reef occupied the position. The original reef, or atoll, it is believed, now forms the cap or summit of the island, and at intervals downwards coral bands exist, which seem to indicate that the elevation must have been gradual and at considerable intervals. These are among some of the valuable results brought back by Mr. Andrews, and science owes a debt of gratitude to Sir John Murray for his liberal enterprise in equipping the expedition. Mr. Andrews will probably give some account of his work at the Bristol meeting of the British Association, and is expected to read a paper on the subject at the Royal Geographical Society's next session. He has brought home about 400 photographs.

GENERAL.

ALTHOUGH Columbus, Ohio, was chosen as the place of meeting of the American Association in 1899, the invitation from Philadelphia was declined with much regret. It was prepared with great care and presented with much cordiality, and it is to be hoped that Dr. Brinton and other Philadelphia members will renew the invitation next year.

THE Council of the American Association authorized last week the appointment of a committee 'to increase the efficiency of the Naval Observatory.' It consists of Professor Picker-

ing, President Mendenhall and Professor Woodward.

HEREAFTER the various Secretaries of the American Association are to be granted \$20 for hotel expenses, provided that during the meeting they reside at the headquarters. This seems to be an excellent plan, though it should also be conditional on their being in attendance throughout the meeting beginning on Saturday. The confusion that is likely to occur in the earlier programs is usually due to lack of preliminary meetings of the Secretaries.

THE plan of holding no general sessions daily of the whole Association received a fair test at the Boston meeting. It gave more time to the sections and greatly reduced the amount of more or less wearisome debate which in former years wasted much time.

THE remarks of President Eliot, in his admirable address before the American Association, on the importance of scientific advice to the nation in time of war, was emphasized by the fact that both the Vice-President, Professor Cooley, and the Secretary, Professor Aldrich, of Section D. (Mechanical Science and Engineering) were detained from attendance at the meeting owing to active service in the Navy.

AT the recent meeting of the American Association, Professor E. W. Morley was appointed to succeed the late Professor W. A. Rogers on the Committee on Standards and Measurements.

THE University of Cambridge has conferred the honorary degree of D.Sc. on Professor Henry P. Bowditch, of Harvard University.

PROFESSOR EDWARD S. MORSE has just been decorated by the Emperor of Japan with the Order of the Third Class of the Rising Sun. A letter from the Japanese Minister at Washington translates the diploma accompanying the Order as follows: "His Majesty, the Emperor, has graciously been pleased to confer upon you this Order in recognition of your signal service while you were in the faculty of science in the Imperial University in Tokio, and also in opening in our country the way for zoological, ethnological and anthropological science and in establishing the institutions for the same."

DR. MARK V. SLINGERLAND, of Cornell Uni-

versity, has been appointed State Etomologist of New York in place of the late Dr. J. A. Lintner.

THE proposed session of the New Mexico Biological Station at Albuquerque in August has been given up on account of the prevalence of smallpox in that vicinity.

A SCIENCE CLUB has been formed at Mesilla Park, N. M. Mr. C. M. Barber is President.

THE opening of Queen Victoria's Cottage Grounds at Kew Gardens will be delayed until spring, as there are no funds available this year for the cost of fencing and other necessary work which must first be carried out.

THE young male giraffe from Senegal, which was one of the latest additions to the menagerie of the Zoological Gardens at London, and for which the Society paid £900, has just died.

THE Report of the South African Museum at Cape Town states that the total number of visitors to the Museum during 1897 was 56,723; this, notwithstanding the fact that the Museum was only open for a little more than eight months is 7,313 in excess of the previous year. The monthly average is 6,482, and the daily average 254, the largest number on a single day being 2,993 on June 22d, the lowest, 96, on November 24th.

MR. J. MACKAY BERNARD KIPPENROSS has contributed the sum of £500 in order that the Ben Nevis Observatories may be continued another year. In his letter to the Scottish Meteorological Society, quoted in *Nature*, Mr. Kippenross expresses the hope that before the end of that year arrangements may have been made for the permanent carrying-on of the work by State aid, and his very liberal and prompt action makes the Directors more hopeful than they were that this desirable end may yet be reached. The question of the position of the Ben Nevis Observatories was brought up in the House of Commons on August 5th, in connection with the annual vote of £15,300 to the Meteorological Council for meteorological observations. The Ben Nevis Observatories now receive an annual grant of £350 from this fund. Mr. Hanbury, Financial Secretary to the Treasury, has undertaken to ascertain whether a larger amount could not be voted, the sug-

gestion being made that a grant of £500 a year should be made for five years.

EXPERIMENTS are being undertaken by Professor Lawrence Bruner, of the University of Nebraska, to determine the methods that might be used in spreading among our native species a locust disease discovered by him in South Africa last year. The disease is closely related to the fungus used for destroying chinch bugs in some parts of the United States. Professor Bruner contributes an article on the subject to the July bulletin of the Nebraska Section of the Climate and Crop Service of the Weather Bureau.

THE *British Medical Journal*, quoting from the *Morning Post*, states that two members of the Italian Chamber of Deputies, Signor Leopoldo Franchetti and Signor Fortunato, have issued a circular proposing the foundation of a society for studying the phenomena of malaria. "The malaria," they state, "keeps 2,000,000 hectares (nearly 5,000,000 acres) of ground in Italy from cultivation; it effects, more or less, 63 provinces and 2,823 communes; and every year it poisons about 2,000,000 inhabitants, killing 15,000 of them. It is impossible to estimate the economic damage done to our country by the scourge, and no sanitary problem is more intimately bound up with the question of our prosperity." The authors of the circular, therefore, propose that a society be formed for studying malaria and for discovering the best means of combating it. Those who contribute 500 lire will have the title of founders, and ordinary members will pay 36 lire a year. Signor Franchetti and Signor Fortunato have subscribed 1,000 lire each.

THE first Congress of Legal Medicine will be held at Turin in October, under the presidency of Professor Lombroso.

A METEOROLOGICAL department in connection with the Federal telegraph service has just been established in Mexico.

THE government of British Guiana has lately taken steps of great practical utility in arranging for geological surveys in the gold districts. *Nature*, quoting from a report on the gold and forest industries of British Guiana, states that a survey has already been conducted by Professor J. B. Harrison in the northwest district

and the results embodied in a report, while an additional report on the petrology of the district is awaiting publication. A further expedition to examine the formations of the Potaro-Conawarook district is now being organized. The great importance of this work will be recognized in view of the fact that there are no trustworthy official reports on the geology of British Guiana in existence. The experience of the past ten years has proved that British Guiana is rich in gold; and what is now needed is the importation into the colony, and the adoption of, mechanical washing appliances for alluvial gold. By such means deposits of alluvial gold, vast areas of which are known to exist, but would not pay to work by the means now employed, could be made to produce large quantities of gold. During the year ending on June 30th the amount of gold exported from the colony was 117,265 ounces, or a decrease of 10,326 ounces upon the output of 1896-97. This serious decrease is partly ascribed to exceptionally bad weather, and partly to the exhaustion of alluvial workings in the Barima district.

THE N. Y. Fisheries, Game and Forest Commission proposes to purchase about 50,000 acres of land in the Catskills, in addition to the 56,212 acres already owned by the State. The Commission reports that deer are increasing very rapidly in the Catskills. It is estimated that the 44 animals turned loose about a year ago have increased to 150, and that there will be between 400 and 500 of these animals at the expiration of the five-year period during which their killing is prohibited.

UNIVERSITY AND EDUCATIONAL NEWS.

THE second cousins of Dr. Elizabeth H. Bates, who died at her home at Port Chester, N. Y., a few months ago, leaving the University of Michigan an estate valued at \$125,000, for the establishment of a chair for diseases of women and children, have filed a notice at Ann Arbor that they will contest the will.

At the New Mexico Agricultural College and Experiment Station, Professor C. H. T. Townsend has been appointed Biogeographer and Systematic Entomologist to the Station; E. O.